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**SUBSTITUTE**

**TITLE OF THE INVENTION**

**COMMUNICATION DEVICE FOR RECEIVING AND TRANSMITTING OFDM  
SIGNALS IN A WIRELESS COMMUNICATION SYSTEM**

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**BACKGROUND OF THE INVENTION**

**FIELD OF THE INVENTION**

The present invention relates to a communication device for receiving and transmitting OFDM signals in a wireless communication system.

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**DESCRIPTION OF THE RELATED ART**

In wireless OFDM communication systems a communication device, as e.g. a base station, communicates with another communication device, as e.g. a mobile terminal, over a wireless communication link using OFDM signals. OFDM (orthogonal frequency division multiplex) is a multi carrier modulation method wherein information to be transmitted is mapped (e.g. by phase shift keying) onto a plurality of orthogonal subcarriers signals of different frequencies which are subsequently combined into an OFDM signal. Each subcarrier frequency defines a transmission channel in which information can be transmitted over the communication link. For more background information on OFDM it is referred, for example, to K. David, T. Benkner: „Digitale Mobilfunksysteme,, , B.G. Teubner Stuttgart, 1996, S. 174-176.

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The communication link causes undesired level fluctuations and distortion of the transmitted OFDM signal, e.g. due to fast fading or delay spread. Diversity methods can alleviate the adverse effects of fading. Using a plurality of antenna elements spaced apart at a certain minimum distance allows, by suitably combining reception signals received by the various antenna elements, to reliably recover the baseband information sent from another communication device even if fading occurs on one or more of the transmission paths across the communication link (receiver diversity). Transmitting one and the same transmission signal mutually delayed from several antenna elements allows to create a beam sharpened antenna pattern and to increase the received signal power at the receiver side (transmitter diversity). For more background information on receiver and transmitter diversity see, for example, EP 0 881 782 A2.

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